

In the Circuit Court of the United States  
DISTRICT OF CONNECTICUT.

NATIONAL PHONOGRAPH COMPANY,  
Complainant,

vs.

AMERICAN GRAPHOPHONE COMPANY,  
Defendant.

In Equity No. 1076.  
Same No. 1103.

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BRIDGEPORT, CONN., January 27, 1904.

Testimony taken for final hearing on behalf of the defendant before E. E. MARVIN, a Standing Examiner of the Court, at the office of the American Graphophone Co., on the 27th day of January, 1904, and put in typewriting by John R. Petrie, as specially agreed to by the parties and appointed by the Examiner.

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Present—R. N. DYER, ESQ., for complainant; PHILIP MAURO, ESQ., for defendant.

Thereupon THOMAS H. MACDONALD, being duly sworn as a witness on behalf of the defendant, deposes and says as follows:

DIRECT EXAMINATION:

Defendant's counsel offers in evidence in No. 1103 the depositions of the following witnesses taken in No. 1076: Eugene E. Norton, Thomas H. Macdonald, Anson A. Stevenson, Eugene A. Burns and Frank H. Osborne.

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Objected to as immaterial, irrelevant and incompetent, and notice is given that a motion to strike out these depositions from the record will be made.

1 Q. Are you the same Thomas H. Macdonald who testified in case No. 1076 on January 13, 1903 ?

A. I am.

2 Q. Please look at question 56 and your answer thereto in that deposition and state whether that answer is correct in all particulars, and, if it is not, please make all necessary corrections.

A. In the answer to question 56 the year should be 1900 instead of 1899, and the year 1900 should be the year 1901. Molded records were first used commercially in the month of November, 1900. They were put on the market probably about the beginning of the year 1901.

3 Q. Have you any record that has assisted you in fixing the dates which you have just given ?

A. I have ; copy of a letter which I wrote to our counsel, Mr. Philip Mauro, on December 26, 1900, regarding the molded master process, on which I find endorsed in my own handwriting a postscript stating " Our average on Friday from 9 molded masters was 77 good duplicates made on an ordinary duplicator. The average of the best ordinary master is only 30."

4 Q. Is there any connection in your mind between the facts stated in that letter and the date when molded records were first put on the market for sale ?

A. There is. From the first we placed in regular product and sold all our surplus molded masters. They were not announced as such to the public but were placed in the regular product made at that time.

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Counsel for defendant introduces a copy of the letter just referred to by the witness, dated December 6, 1900 ; and complainant's counsel having inspected the press copy in Mr. Macdonald's copy book, stipulates that the copy



offered in evidence may be used in lieu of said press copy with the same force and effect as if the latter were used.

5 Q. Is there any patent in existence which describes the composition used by you in the manufacture of molded records at defendant's factory?

A. There is. No. 606,725, issued to me July 5, 1898, describes the composition used in making these records.

6 Q. Is that or is it not the same composition which defendant was using at the time for the manufacture of its blank cylinders?

A. It is the same.

7 Q. Have you read a copy of the deposition of complainant's witness, Rosanoff, and of complainant's witness Edison, in this case No. 1076?

A. I have.

8 Q. I call your attention to question 76 of Mr. Edison's deposition, wherein he was asked whether your Patent 682,991 describes "an operative method of making a duplicate phonograph record"; and to the first clause of his answer, which says, "From reading it and from my experience I should say no." Please state whether the process described in that patent is an operative method; and you may state whether you have used it for making records commercially and how many per day you have made by it, if any?

A. It does describe an operative process. We have used the exact process described in this patent, and have produced as high as 20,000 records per day by it.

9 Q. In practicing that process what is the lowest temperature to which you have found you can superheat the wax without sacrifice of quality?

A. About 375 degrees. I mean by this that in the hands of the ordinary workmen we have established 375 degrees F., as a measure of safety. We have obtained good records, and can do so at 350 and possibly even at some lower temperature, but speaking



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from the commercial side of manufacture, I consider 375 a safe limit of the minimum temperature of 375 F.

10 Q. What is the actual factory practice in this respect?

A. Each molder is provided with a thermometer and instructed to keep the temperature of his wax while molding as near 375 as possible, and under no circumstances to attempt to mold below 350. As a matter of fact the temperature is maintained very close to 375.

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11 Q. Referring to your Patent 682,991, I will ask you what will be understood in the art by the following passages therein :

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"The melted material (soap mixture or the like) which is hereinafter for convenience designated 'wax'" and the following "The composition at present employed (which is a mixture of two ingredients as stearic acid and ceresin, both the hardness and melting point or solidifying point of one ingredient being higher than the other)."

A. The ordinary blank composition in general use and as described in my Patent No. 606,725.

12 Q. Do you know of any patents other than that granted to you, referred to in your last answer, namely, No. 606,725, which gives a formula for the manufacture of a soap mixture for use in making sound records?

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A. I do not.

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13 Q. In that patent the stearic acid which is the largest ingredient is treated with caustic soda lye so as to produce partial saponification. Have you ever known of stearic acid being used for making sound records without partial or complete saponification?

A. I have not.

14 Q. Referring now to the deposition of Mr. Rosa-noff, I call your attention to his series of experiments marked "a," and ask if the material used by him in those experiments was a mixture that has ever been



used in the art of making sound records to your knowledge? Please assume in your answer that the stearic acid was not saponified, either wholly or in part.

A. I have never known of records being made from such mixture; that is of unsaponified stearic acid and ceresin.

15 Q. Referring to the series of experiments marked "b," Mr. Rosanoff says, that superheating is harmful because it increases the chances of the mold being attacked by the material. Have you ever had that difficulty?

A. I have not.

16 Q. He says, second, that during the accelerated cooling the casts are more liable to crack than when the cooling is more gradual. Is that in accordance with your experience?

A. It is not.

17 Q. Is cracking so much a question of rapidity of chilling or of degree to which the chilling is carried?

A. It is entirely a question of the degree to which the chilling is carried. If the accelerated chilling is carried until the cylinder becomes as cold as the tap water used, there is liability to crack; there is just as much liability however if this condition is brought about either rapidly or slowly.

18 Q. Mr. Rosanoff says that the resulting cylinders are "considerably more brittle than when moulded in the ordinary way." Is this a fact; and if so, what does it show?

A. It is a fact, and indicates that the very rapid chilling from the outside drives the ceresin to the centre of the mixture, which in this case is the interior of the cylinder, leaving the surface composed very largely, if not entirely, of the saponified stearic acid, which being much harder is consequently more brittle and, of course, more liable to fracture.

19 Q. Mr. Rosanoff says, fourth, that no hardening of the surface is produced by the accelerated cooling. Is it or not the fact that the process described in your Patent No. 682,991 results in a record having a harder



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surface than that of a blank produced from the same material in the ordinary way?

A. The process does produce a harder surface than the ordinary blank.

20 Q. Of what ingredients is the mixture used by defendant for molding sound records composed?

A. Saponified stearic acid and ceresin.

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21 Q. Your Patent 606,725 provides that the stearic acid after it has been prepared in the manner set forth, shall be mixed with a relatively small proportion of paraffin ozokerite, ceresin, or similar material. What is ceresin?

A. Ceresin is refined ozokerite.

22 Q. Have or have not these two ingredients the same melting point?

A. They have not the same melting point. Ozokerite or ceresine melts readily at about 130 degrees. The melting point of the saponified stearic acid is about 240.

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23 Q. Are these the temperature at which the materials you have referred to congeal, or that at which they are fully hardened?

A. It is the temperature at which they congeal. In the case of ceresin this point is quite sharply defined. The material passing readily and quickly from a liquid state to a solid. In the case of the saponified stearic acid the melting point is not so clearly defined. The material passing first to a jelly-like state and then to the harder or solid condition.

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24 Q. Is there anything in Mr. Rosanoff's deposition that shows just what material he used in his series "b" experiments?

A. There is not.

25 Q. On page 256 he speaks of it as a material which "retains its transparency." Do you know of any transparent sound recording material?

A. I do not.

26 Q. On the same page he speaks of it as "a mixture of more than two ingredients" without saying how many. Does the ordinary composition



used by defendant have more than the two ingredients mentioned in a previous answer of yours?

A. It does not.

27 Q. Does this ordinary sound record composition employed by defendant have any tendency to stick to the mold?

A. It does not.

28 Q. Mr. F. L. Dyer, expert witness for complainant herein, has testified in effect that it is not practical to mold sound records which have been made with the old chisel shaped recorders in use in the art prior to 1890. Are you familiar with the recorders as used by the defendant and by the Edison company prior to 1890?

A. I am.

29 Q. Can you state whether there is any difficulty in molding sound records cut with recorders of the kind used in 1890 than there is in molding those made with the curved edge recorder?

A. There is not. They can be molded just as readily as those made with the circular recorder.

30 Q. State what, if anything you have done to determine this?

A. I fitted one of our standard recorders with a cutter made exactly to the shape of that used and patented under the Bell and Tainter Patent of 1886 and also like that used upon the Edison phonograph of 1887 and 1888 and made such records with this recorder. These were put through the usual processes, records were molded from the matrices, and good results obtained, fully equal to the ordinary product.

31 Q. Can you produce the recorder used by you in that experiment and one or more of the records?

A. I can.

Counsel for defendant offers in evidence the recorder just referred to by witness, and one of the records, and marks the former "Defendant's Exhibit Chisel Point Recorder" and the record "Defendant's Exhibit Cast Record With Square Cut Groove."



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Defendant's counsel states that he will be pleased to furnish one of these molds and any reasonable number of records to complainant's counsel, if the latter wishes to examine or experiment therewith.

32 Q. How many matrices of these square cut records did you make?

A. Four.

33 Q. Did or did not all of them give good commercial results?

A. They did.

34 Q. Mr. Dyer seemed to think that the longitudinal contraction which a sound record undergoes after it has set would, in the case of a square cut groove, injure the latter before it freed itself from contact with the wall of the mold. Is that theory well founded?

35 A. I have not found it so; but I found that they did free themselves readily.

36 Q. Reference has been made in this case to the use of "duplicating machines." Can you refer to any patent or patents which show what is meant in the art by "duplicating machines."

A. I can. To No. 341,287 issued to S. Tainter, May 4, 1886, and to No. 559,806, issued to T. H. Macdonald, May 12, 1896.

37 Q. I call your attention to a circular introduced by complainant and marked "Complainant's Exhibit Announcement of Advent of Defendant's Molded Records" and call your attention to this statement, "Columbia records can be shaved, if desired, and the blank recorded upon. This is true of no other new record on the market." Does that indicate that the molded record referred to had a relatively soft surface?

38 A. It does not. When the record was shaved the surface is entirely removed by the shaving knife and the softer material beneath becomes the new recording surface.



## CROSS-EXAMINATION BY MR. DYER:

Complainant's counsel renews his objection to the introduction of the case No. 1103 of the depositions referred to at the beginning of today's record, which were taken in case No. 1076, no foundation having been made for the introduction of these depositions.

Defendant's counsel states that as he understands equity practice defendant has the right to read in evidence herein depositions taken in another pending suit between the same parties, particularly as that suit relates to the same manufacturing process of the defendant.

Complainant's counsel replies that while the parties are the same the subject matter is different, and so far as it appears the witnesses are alive.

37 x-Q. Your letter of December 26, 1900, to Mr. Mauro refers to a recent letter received from him. Have you that letter?

A. I do not know.

38 x-Q. It is probably in your files here in this office?

A. It is probably on file here.

39 x-Q. Will you have a search made for it?

A. I will.

Defendant's counsel objects to the foregoing questions as immaterial.

40 x-Q. At the date of this letter, December 26, 1900, were you using cut records as masters in your duplicating work?

A. We were.

41 x-Q. To what extent were you using molded records for that purpose at that time?

A. I think we had about 25 molded masters then completed from which molded records were used as



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duplicating masters. That is, 25 different selections had been used from which to make the master matrices. Of course from these selections cut masters were no longer used on the duplicating machine.

42 x-Q. What was the total number of selections from which you made duplicate records around that time?

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A. As stated in the last answer, I think we had at that time about 25. We added to these at the rate of about three a day during December and this product, as I recollect was increased to probably five a day during January. I think at the 1st of January, 1901, we probably had 40 selections in use.

42½ x-Q. (Q. repeated.)

A. The total number of selections used was in the neighborhood of 800.

43 x-Q. At the time you speak of when you had 25 selections in the form of molds from which you produced molded duplicates for use as masters, what were your facilities for molding duplicates from these molds?

A. I had but two molding apparatus for making them.

44 x-Q. As I understand your correction to Q. 36 of your former deposition molded duplicates were sold without being announced as such to the public by placing them with your regular product early in 1901. Is that right?

A. That is right.

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45 x-Q. That means that you sent them out with your cut duplicates without calling the trade's attention to the difference?

A. It does.

46 x-Q. Did you do this with the molded records after they were used as masters in the duplicating machines?

A. Some of these may possibly have been sent out; I think they were, but the greatest number that were sent out were from surplus stock that we molded, and had laid aside to be used as masters, but which we found were not needed for such.



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47 x-Q. Was it your practice at that time to put your molded duplicates into stock with the cut duplicates after they had been somewhat worn by use as masters?

A. In some cases, I think it was. It would depend upon the condition of the master. As soon as we obtained the molded masters in quantity from any selection, we would use a molded master only a limited number of times. This for the purpose of getting the best possible duplicates. In such case, if the master used showed no perceptible wear, it was placed in stock with the other records.

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48 x-Q. What was your reason for making cut duplicates from these selections, of which you had molds to make molded duplicates?

A. For the reason that the selections were the most popular, and our molding capacity was entirely too limited to supply the demand. As soon as we reached the point where our molding capacity would supply the demand, we did so.

43  
49 x-Q. In the announcement of February 15, 1902, you say, "list of selections will be issued soon," referring to molded records. Can you supply me with a copy of your first list of selections of molded records?

A. I cannot. These lists were all issued by the Columbia Phonograph Co., our selling agency, and were not prepared by me or any one under my jurisdiction. I have no copies of them; I presume that company can supply them.

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Complainant's counsel asks defendant's counsel to furnish the list of selections referred to in the last question.

Defendant's counsel states that he will endeavor to comply with this request, and will furnish the list, if possible.

50 x-Q. You refer to your Patent 606,725 as describing the composition used by the defendant in the man-



45 manufacture of molded records. Do you mean used at the present time?

A. I meant used at the time of which I was testifying.

51 x-Q. I refer to your answer to Q. 5, in which you say that that patent "describes the composition used in making these records." Did you not refer to the present time in that answer?

46 Defendant's counsel objects. The only material period in this case would be that preceding the filing of the bill of complaint in No. 1103. If, however, the material in use at the present time is different from that used in 1902, defendant's counsel has no objection to the witness stating the difference?

47 A. In that answer I had in mind the time we are now discussing; that is, about January 1st, 1901. The same composition is now used, with the exception that there is a hardening material added.

52 x-Q. The composition of this Patent 606,725 you use at the present time for your cylindrical blanks?

A. We do.

53 x-Q. And it was so used by you at the date of the announcement, February 15, 1902?

A. Yes, it was.

48 54 x-Q. Were the molded records which you brought out in accordance with that announcement on or about March 1st, 1902, made with that composition?

A. They were.

55 x-Q. Please look at that announcement, which I now hand you, and state what the "New Record" referred to at the end of the announcement refers to?

A. I do not know. I did not write the announcement. To my knowledge I have never seen it before.

56 x-Q. Do you not recall the fact that the Edison molded record had been advertised before this date as



a "new" record made of "hard wax" not useful for shaving down to produce a blank for recording upon?

Defendant's counsel objects to the question as immaterial, and states that he has not any doubt that the writer of that circular had reference in the passage quoted to the new Edison molded record, specimens of which had been sent around and which had been announced shortly before that date.

Complainant's counsel desires to secure the fact from the witness rather than from defendant's counsel, and since the cross-examination is directly on the matter brought out by the direct examination he suggests the impropriety of this statement by defendant's counsel.

Defendant's counsel regrets his attempt to facilitate matters by admitting what he supposed complainant's counsel wished to establish, which apparently was not within the knowledge of this witness.

A. As stated before I have no recollection of ever seeing the circular mentioned; in fact I am quite certain that I never did see it before. As a matter of fact I rarely see these trade circulars. As a general recollection I remember the Edison record was announced in the manner described, but whether it was at the time of the date of this circular, before it or after it, I do not recall. I presume that this circular did refer to that record, though it might have referred to the Lambert record, which cannot be shaved, and which I think then was at least announced, though I am not sure that anything more was done than that.

57 x-Q. Are your molded records at the present time useful in the manner of the molded records referred to in this announcement of February 15, 1902, namely, useful to be shaved, to form blanks for recording purposes.

Objected to as immaterial.



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58 A. Their usefulness in this respect has been somewhat impaired by the addition of the hardening material which I have before mentioned though they may still be shaved and used as a blank.

58 x-Q. In this respect your molded records at the present time are like the Edison molded records?

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A. My understanding of the Edison record is that it is too hard to use as a blank. I gather this from their own announcement; I have never tried to use one as a blank. I have used ours and obtained very fair results. In point of hardness I think they are very near together.

60 x-Q. Your molded records in 1902 were different in color from your present molded records?

A. They were.

61 x-Q. How was this difference produced?

1274  
A. By the addition of materials to make them uniform in color; that is, uniformly black.

55 Defendant objects to the two preceding questions as immaterial.

62 x-Q. In this respect your present molded record also resembles the Edison molded record?

Same objection.

A. It does.

56 63 x-Q. I gather from your answer to Q. 8 that you use the process of your patent 682,991 at the present time in the manufacture of molded records at defendant's factory? Is that correct?

A. That is correct.

64 x-Q. Did you also use that process in March, 1902?

A. We did.

65 x-Q. Do you use it now precisely as described in your patent?

A. Substantially as described in the patent, with the addition of the hardening and coloring material.



66 x-Q. Your present molded records have internal ribs in the form of separate parallel rings; is not that so?

A. It is.

67 x-Q. How do you get the molded duplicates off of the core, which in your patent is shown as provided with a spiral groove from which the duplicate can be unscrewed.

Defendant's counsel objects to the question as immaterial, as not having relation to any issue in this cause as clearly going beyond the limitation imposed by the Court's order herein, and as evidently being intended not for use as evidence in this case, but for the purpose of securing evidence that may be useful in its suits recently brought by this complainant against this defendant when Patent No. 683,676 granted to Aylsworth & Miller, and No. 683,615, granted to Miller and Aylsworth, dated October 1, 1901. For these reasons defendant's counsel is constrained to instruct the witness not to answer the question.

Complainant's counsel replies that the order of the Court permitted the defendant to take testimony to show "that the process described in the Macdonald Molded Record Patent," meaning Patent 682,991, "is practical, useful and operative." In accordance with that permission the defendant attempted to show by this witness that that process is practical, useful and operative, because, among other reasons, it is used at the present time by the defendant in its manufacture. Complainant's counsel proposes to show by the cross-examination of this witness that the process of the Macdonald Patent is not used at the present time by the defendant in its manufacture. This is evidently a subject upon which he is entitled to cross-examine the witness in view of his direct exam-



ination. Complainant's counsel has no intention to go outside of the direct examination or to procure from the witness admissions of fact which may be useful to the complainant in the prosecution of the suit in the Aylsworth and Miller Patents; but if the result of the cross-examination is to procure such facts complainant's counsel is not responsible for the situation nor is his cross-examination made less pertinent to the present case thereby.

Defendant's counsel replies: First, that he has not asked any such question as attributed to him by complainant's counsel; second, that the question of operativeness of Macdonald's process has plainly no connection at all with defendant's operations at the present time; and, third, that Macdonald's process, as described in the patent referred to, has no relation whatever to the use or non-use of a core, but specifies simply the steps of introducing material into a mold, superheating it, and chilling it from the superheated temperature.

Defendant's counsel must, therefore, adhere to the instructions given to the witness.

A. I decline to answer under instructions.

Complainant's counsel gives notice that he will move the Court to compel the witness to answer, but in order to save time while ascertaining when the Court can hear such a motion, he will continue his cross-examination without prejudice to his rights.

Adjourned until Thursday, January 28, at 10 o'clock  
A. M.



BRIDGEPORT, CONN. <sup>January</sup> ~~February~~ 28, 1904.

Met pursuant to adjournment.

Present—Same parties.

Whereupon the cross-examination of T. H. MACDONALD was continued.

(The Witness :) I desire to make an explanation with reference to my answers to x-Qs. 63 and 64 and 65. In answering these questions I had in mind the patent for material for manufacture of Graphophone tablets, No. 606,725.

68 x-Q. Please look at your direct examination, answers 8, 9 and 10, and observe that Q. 10 asks "what is the actual factory practice in this respect." Did you not intend to state, in the answers referred to that the process of your Patent 682,991 is used at the present time in the manufacture of molded records at defendant's factory?

A. My answer intended to describe the exact practice in using the process in the patent, which practice we have pursued in the factory in the manufacture of many hundred thousands of records. I did not particularly have reference to the present time, but did have particular reference to the commercial use of this process.

69 x-Q. You did not intend to state that the process of your Patent 682,991 is in fact used at the present time for the manufacture of molded records at defendant's factory?

A. I did not have that idea in mind one way or the other. I interpreted Q. 10 to be simply a continuation of Q. 9, which asks merely what is the lowest temperature to which you have found you can superheat the wax without sacrifice of quality, and in answer to Q. 10 I intended to state what I had established as a factory practice in that particular respect.

70 x-Q. What is the fact regarding the use or non-



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use of the process of your Patent 682,991 by the defendant at the present time ?

A. That process is still in use in the factory.

71 x-Q. Is it the process by which your commercial molded records are made at the present time ?

A. It is.

72 x-Q. All your molded records are made by that process now ?

70 A. All made by that process now.

73 x-Q. The molded records which you put out in March, 1902, had a spiral rib like that shown in Fig. 3 of your Patent 682,991 ?

A. They had.

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74 x-Q. The Edison molded record at that time had internal ribs in the form of separate parallel rings like your present molded record ?

A. I am not certain about that, as I did not see any of the Edison records at that time.

75 x-Q. When did you change your records in respect to this form of the ribs ?

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Objected to as immaterial, and defendant's counsel must repeat the instructions given with reference to x-Q. 67. He calls the attention of the Court to the fact that the matter of ribs inside the record has nothing whatever to do with any issue in this case ; that this cross-examination is clearly contrary to the order of the Court herein.

72 A. Under instructions I decline to answer.

Complainant's counsel makes the same statement, and gives the same notice that he made and gave in connection with the 67 x-Q. and answer.

76 x-Q. At the time you changed the form of the rib from the spiral rib to the separate parallel rings, you



then knew that the Edison molded record had the latter construction?

Same objection.

A. I did.

77 x-Q. What were the causes that led you to change the composition from which you made your molded records in the two respects already referred to, and to change the form of the internal ribs in the respect referred to?

Same objection.

A. The reason for this was to improve the appearance of the inside of the cylinder. I found that the chilling of the record from its superheated condition drove the paraffin or ceresin to the internal part of the cylinder against the core, and that when the core was removed the superabundance of paraffin or ceresin left the inside of the cylinder in a quite objectionable looking surface. To get rid of this, we reamed it out deeper while it was hot or in a somewhat plastic condition. This is in answer to the last part of the previous question. The object of adding coloring matter was for the same reason; that is, to make a uniform product. I found that repeated boiling or repeated melting of the material had a tendency to make it black. The material when originally made is nearly white, but blackens rapidly through cooking or heating in the melting pots. The result of this was that the color of the product was irregular. To make it regular I added sufficient coloring material to have it always black. Hardening material was added for the purpose of making the cylinder harder, as it was our belief that the harder the material the longer it would last, provided we did not get it too hard or make it too brittle.

78 x-Q. In view of your answer to the last question which was given with the approval of defendant's



74 counsel, I assume you have no objections now to answering 67 x-Q. which I now repeat.

Defendant's counsel repeats the same objection as that given to x-Q. 67, and states that while he may have no objection to that question being answered in the suits in the Aylsworth & Miller Patents it is clearly an improper question in the present case.

78 A. Under instructions I decline to answer.

Complainant's counsel gives the same notice as to x-Q. 67.

79 x-Q. Since it is evident that you are not now using in all respects the process described in your patent 682,991, please state in what respects your present process differs from that specifically described in that patent?

Defendant's counsel objects to the assumption contained in the question as not warranted by the evidence herein.

80 A. My conception of my claims in the patent mentioned were three. First, process for filling the matrix with suitable composition, maintaining the heat for a time, then suddenly symmetrically chilling it. The second, is for the process of making the sound record by the use of steam for superheating the mold. Third, is the claim for maintaining the mold, when filled with the composition, in a superheated condition for a suitable time. We use this process in the factory to-day, with the exception that we do not use steam for maintaining the superheat.

80 x-Q. I do not refer to what you may regard as the invention covered by the claims of your patent, but to the process specifically described in the specification and explained therein by reference to the drawing.



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With this understanding please answer the last question?

A. It specifically differs in the substitution of a heated wax for steam, maintained at a uniform temperature, as near as the workmen can, 375 degrees F., and I believe that is the only difference.

81 x-Q. How is the heated wax applied?

A. The mold is immersed in the heated wax substantially as shown in the drawing, assuming the space in the drawing now provided for steam to be filled with hot wax.

82 x-Q. That is to say, you use a jacket of hot wax and pour the wax to be molded into the mold from the top, as shown in the drawing of your Patent 682,991?

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Defendant's counsel has permitted this cross-examination to go far beyond the limits of propriety. He objects to this question, instructs the witness not to answer it, and notifies complainant's counsel that he will not permit any questions relating to the details of the apparatus employed in defendant's molding plant. If complainant's counsel really believes that he is entitled to ask such questions he is invited and urged to take the matter to the Court for a ruling.

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Complainant's counsel replies that he thinks the witness is mistaken in his assertion that the process of his patent 682,991 is used at the present time by the defendant. The discontinuance of the use of that process (if it has been discontinued) certainly has something to do with its practical utility. But evidently defendant's counsel will not permit the facts to be brought out by cross-examination. The present question was intended to bring out the fact which was skillfully hidden by the witness in his answer to the next preceding question, both questions being certainly warranted by the direct examination.

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A. Under instructions I decline to answer.

Complainant's counsel repeats the same notice.

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83 x-Q. What is the purpose of the ceresin in the composition described in your Patent 606,725?

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A. The object of its use in this patent at the time of the application, in 1896, was primarily for the purpose of tempering the material to a degree of hardness suitable for cutting records on its surface in the usual manner.

84 x-Q. Did it not have the effect of making the tablet or blank non-hygroscopic preventing the formation of a mold on its surface, which the patents speaks of as efflorescence?

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A. It is possible that it has this effect, though the use of paraffin, ozokerite or ceresin in this patent was not for that purpose, as the material which I use here was absolutely non-hygroscopic without the use of either paraffin or ozokerite.

84a x-Q. In your answer to Q. 26 you state that the ordinary composition used by the defendant (which from your answer to Q. 27 appears to mean composition used for making molded duplicates), is one not having more than two ingredients. What did you mean by that answer?

1298  
82  
A. I mean by that saponified stearic acid and ceresin. I consider that when certain elements have been chemically combined they form an ingredient, or one ingredient, in the manufacturing, or commercial sense.

85 x-Q. Did you not omit to include in answering Q. 26 the hardening material and the coloring matter?

A. The question referred to a deposition of Mr. Rosanoff. Mr. Rosanoff testified that he worked under the terms and directions of my Patent 682,991, dated September 17, 1901. At the time of that patent I used no coloring matter and no hardening matter; therefore



my answer had reference simply to what Mr. Rosanoff had interpreted by my language in that patent.

86 x-Q. You did not intend then to refer to the present composition used by you in molding records?

A. I intended to specifically answer the question which was pointed at the Rosanoff deposition and which referred, as I have said, to the language of this patent.

87 x-Q. (Question repeated).

A. I did not; I intended to refer to the composition spoken of by Mr. Rosanoff.

BY DEFENDANT'S COUNSEL: I desire to call attention to the fact that the material which Mr. Rosanoff claimed to have used in his Series "b" experiments was "the ordinary composition on the market at the date of the patent," meaning the Macdonald Patent No. 682,991 of September 17, 1901.

88 x-Q. In the making of records, such as "Defendant's Exhibit Cast Record with Square Cut Groove," what process did you follow in molding the records?

A. The processes I have already described.

89 x-Q. Do you mean the process at present used in the factory for molding records?

A. Yes.

90 x-Q. Was the wax composition employed in the molding of these square cut records the same as that which you now employ in the molding of your commercial records?

A. The composition is the same.

91 x-Q. In the making of the original square cut record from which the molds were formed how deep was the cut or groove on the surface of the record?

A. Substantially the half of one-thousandth of an inch; possibly in some places it would go to seven ten-thousandths of an inch, which is probably a little deeper than the records made from any round recorder at present on the market.



92

92 x-Q. What is the depth of records made with round recorders for the use of molds for duplicating?

A. It is about six ten-thousandths of an inch; at least with the ordinary cutter, or forty thousandths of an inch diameter at a depth of six ten-thousandths of an inch very nearly the ridge between the groove is cut to a perfectly sharp edge and if the cutter is forced deeper than this it will cause a lapping of the grooves and produce what we call "echo" in the reproduction.

94

93 x-Q. How did you test the square groove molded duplicates which you made to ascertain their degree of perfection?

A. With a reproducer with a square edge point.

94 x-Q. Did you preserve the reproducer?

A. I did.

95 x-Q. Can you produce it?

A. I can and do.

96

96 x-Q. How did the reproduction from these square grooved duplicates compare with that of your commercial molded duplicates?

A. They compare very favorably.

97 x-Q. How many of the square groove molded duplicates did you test for reproduction?

A. Personally I have tested about a dozen or fifteen.

98 x-Q. How many of these duplicates did you make from the molds?

96

A. That I do not know. I have seen perhaps 20 of them. I put them in the hands of the foreman of the department and told him to give me a sufficient number to thoroughly test it, in his judgment. I recollect now that he brought me about a dozen or fifteen of them.

99 x-Q. You do not know whether those were all he molded from these molds?

A. I do not.

100 x-Q. Of the dozen or fifteen which he brought you, was there any difference in the quality of the reproduction?

A. No difference.

1302

1303

1304



101 x-Q. Referring to "Defendant's Exhibit Chisel Point Recorder," this form of recorder, with the exception of the form of the point, is your commercial recorder of the present day, is it not?

A. It is.

102 x-Q. Covered by patents taken out by you since 1890?

A. It is.

103 x-Q. What is the material of which the point is made?

A. Sapphire.

104 x-Q. Jewel or sapphire recording points were introduced into the art after 1888, were they not?

A. It was after 1888, as far as my recollection goes.

105 x-Q. What was the date of the introduction of such recording points, approximately, as you now recall the fact?

Objected to as immaterial.

A. I think it was after 1890, after the beginning of the year 1890.

106 x-Q. I observe that the point in "Defendant's Exhibit, Chisel Point Recorder," has, when looking at its end, sides which converge toward each other, as they approach the cutting edge of the point. What, if you know, are the angles of these sides?

A. I do not know what angle.

107 x-Q. The groove which is formed with the point of this recorder is one having diverging instead of parallel walls?

A. Theoretically they are; as this angle, though, is probably not over 10 degrees and the depth not over seven ten-thousandths of an inch, the actual slope of those walls is, in my judgment, too small to be measured.

108 x-Q. Did you have a search made for the letter from Mr. Mauro, referred to in your letter to him of December 26, 1900?

A. I did.



101

109 x-Q. Can you produce it?

A. I could not find it.

Complainant's counsel requests defendant's counsel to supply a copy of this letter.

Defendant's counsel will endeavor to do so.

RE-DIRECT EXAMINATION :

102

110 Re-d. Q. Did you ever use hardening material in sound record compositions before 1902?

A. I did not.

111 Re-d. Q. Did you ever make black sound records before 1902?

A. I did.

112 Re-d. Q. Disk or cylinder, or both?

A. Both.

113 Re-d. Q. Did you ever use black coloring matter in sound records before 1902?

103

A. I did.

114 Re-d. Q. Please look at your answer to Q. 8 and state whether or not the statement therein made is true of the year 1902?

A. It is true of that year.

115 Re-d. Q. What was the shape of the original Bell & Taintor recorder with reference to the sides of the stylus point?

A. The sides of the cutter were sloping in such a manner that the record groove was slightly wider at the top than at the bottom.

104

116 Re-d. Q. Did they converge more or less than "Defendant's Chisel Point Recorder"?

A. This recorder point is, as near as I can make it, of the same taper as the Bell & Tainter recorder of that time.

117 Re-d. Q. Can you refer to any patent showing the shape of an Edison recording point of a date prior to 1890?

A. I can and do. To Patent No. 400,647, dated April 2, 1889. In this, under Fig. 5, is shown a



recording stylus, marked "K," with sloping sides. The description states that it is to be "made from flat plate steel, with its side edges slightly filed away, as shown in the exaggerated view, Fig. 5."

118 Re-d. Q. What means did you use in 1899 for superheating the mold and material therein in making molded records?

A. By means of superheated wax surrounding the matrix.

119 Re-d. Q. What means of superheating did complainant's witness Pierman see in use by you at the time he testified, about in 1899?

A. At that time in my experiments I used the superheated wax just referred to, surrounding the matrix or mold, and this is what he saw.

Counsel for the defendant states that he shall refer in argument to definitions of the "shrink" rule or "shrinkage" rule used in the art of casting, such definitions as contained in Century Dictionary (1889) and the Pattern Makers' Hand Book, Hasluck (1887) page 10, etc., extracts from which he will print in this record for the convenience of counsel and of the Court.

Defendant's counsel further states that he has learned since coming to Bridgeport yesterday of certain matters of common knowledge in the art of casting and within the knowledge of this witness of which the Court should be informed. As these matters are not within the order of the Court, if strictly construed, he will ask these question *de bene*, and will move the Court to admit the same when complainant's counsel makes the application to the Court, of which he has given notice, or (in the event of such application be not made) at the final hearing.

Complainant's counsel states that he has no objection to the putting in as a part of this record of the definitions from text-books re-

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ferred to by defendant's counsel; but he does object, however, to the examinations of the witness on the new subject matter suggested by defendant's counsel in advance of an order permitting him to do so. He will oppose the granting of such an order on the ground that the matter intended to be proved is in no sense a reply to any testimony taken by complainant, but is simply cumulative of testimony previously put in by the defendant.

110

Defendant's counsel says that he takes this testimony in No. 1103 as a matter of right, and the only question would be whether the Court would consider it also in No. 1076.

Complainant's counsel suggests that if defendant's counsel wishes to take the testimony in No. 1103 he should do so by a separate deposition, and not in a deposition taken in both cases.

111

Defendant's counsel accepts this suggestion.

#### RE-CROSS-EXAMINATION BY MR. DYER:

120 Re-x-Q. What time did your factory capacity for making molded duplicates reach 20,000 a day?

A. During the months of November and December, 1902.

121 Re-x-Q. Was not the Bell & Tainter recorder provided with a V-shaped cutting point, terminating in a sharp point?

A. It was not.

122 Re-x-Q. Is not that the shape shown in the Bell & Tainter Patent No. 341,214 of May 4, 1886?

A. This point is a section of an ellipse, it seems to me. It is not clearly described in the printed matter, but appears as though the point would have that form from the drawing. As a matter of fact the point which I used at that time, or a later time, and samples of which I have now, have a chisel-shaped point, as



near as possible, like that with which I made the record referred to in this case.

The description in the Bell & Tainter patent calls for a cutting or engraving of the record in the form of a groove with sloping walls.

A. E. BELCHER, a witness duly sworn on behalf of the defendant, is examined by Mr. Mauro.

DIRECT EXAMINATION :

1 Q. Please state your name, age, residence and occupation ?

A. My name is A. E. Belcher ; age, 45 ; residence, 1165 Broad Street, Bridgeport, Conn. ; occupation, foreman of the record department of the American Graphophone Co.

2 Q. Were you foreman of the record department in the year 1900 ?

A. I was.

3 Q. Please state as nearly as you are able to do so when you first began to use molded records as masters in your department ?

A. November 2d, 1900.

4 Q. Do you know how many molded master records you had in use during that month ?

A. In November we received 204.

5 Q. How are you able to give the date and figures which you have given. ?

A. From dates that I kept at that time.

6 Q. Did you have any surplus molded records, I mean molded records which you did not use as masters and if so, please state what was done with them ?

A. The molded records were received and tested and what were suitable as masters were passed as such and the balance which were good as records were turned over to the record stock room.



117 7 Q. Is that the stock room from which orders are filled and shipments made?

A. It is.

CROSS-EXAMINATION BY MR. DYER :

1320 8 x-Q. Do your records show how many different selections you had in November, 1900, of these molded master records?

118 A. It does not.

9 x-Q. The 204 master records were then many of them records of the same selection?

A. They were liable to be, a great many of them were of the same selection, a good many of them.

10 x-Q. Do you recollect how many different selections you had at that time in the form of molded masters?

A. I don't remember of only two or three; I remember that many.

119 11 x-Q. You say that the molded records were tested and what were suitable as masters were passed as such and such of the balance as were good as records were turned over to the stock room. Why weren't these that were turned over to the stock room not good enough as masters?

A. They were too much out of shape to run and be able to duplicate from.

120 12 x-Q. What proportion of these molded records which you received at that time were passed and used as masters?

A. I wouldn't be able to state.

13 x-Q. Were most of them good for masters or only a few of them?

A. As far as I can remember quite a few of them were passed as masters.

14 x-Q. Of those that were rejected as masters did they all go into the stock room for sale?

A. All those that we received except such as those that were broken or damaged.



15 x-Q. What did you do with these molded masters after you had used them for duplicating?

A. We broke them up.

16 x-Q. Weren't they in many cases sent into the stock room and added to the stock of duplicates?

A. Not molded records; they were not sent in. Previous to that we sent any rejected masters to the stock room.

17 x-Q. When you say that you recollect only two or three selections in the form of molded masters in November, 1900, do you mean at any time in November?

A. The first of November I am speaking about; I can't state how many we had the latter part; I know we had a few more.

18 x-Q. How many selections did you have by the first of January, 1901?

A. I am unable to state, as we kept no record of the different selections in my department.

19 x-Q. When was the capacity for making molded records in the defendant's factory equal to 20,000 records a day?

A. That is outside of my department; I am unable to state.

20 x-Q. What does your department include at the present time?

A. The inspecting of the records, there to be turned over to the molding and finishing department.

21 x-Q. When did your department begin to receive as many as 20,000 of these molded records a day?

A. As near as I can state the fall and winter of 1902.

22 x-Q. It might have been, however, sometime in the fall of 1903?

A. I am quite sure it was in December, 1902, we were making them.



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HERBERT A. BUDLONG, a witness produced by and on behalf of the defendant, being duly sworn, is examined by Mr. Mauro.

DIRECT EXAMINATION :

1 Q. Please state your name, age, residence and occupation?

126 A. My name is Herbert A. Budlong; age 27 years; residence Bridgeport, Conn.; occupation executive officer American Graphophone Co. and the Columbia Phonograph Co.

2 Q. I call your attention to an announcement of the Columbia Phonograph Co., dated February 15, 1902, form 484, "Complainant's Exhibit Announcement of Advent of Defendant's Moulded Records"—was that circular the announcement of the advent of the molded record, or if not, just what does it announce?

127 A. This circular refers first to a reduction in the price of "P" records, and, second, to the "extra loud, high speed" molded record as distinguished from the ordinary molded record.

3 Q. Can you produce any circular of the Columbia Phonograph Co. relating to molded records which was issued and circulated prior to the 15th of February, 1902?

128 A. Yes, sir. I have in my hand a letter addressed by myself to the Legal Department under date of January 14, 1904, in which I gave information concerning the distribution of Form 478. This letter is based on examination of the actually endorsed shipping orders covering the shipment of Form 478; and the letter is absolutely correct. Form 478 ("A Revolution in Record Making!"), was sent out January 11 to 14, 1902, in quantities ranging from 200 to 1,000 copies per office, to 14 local offices of this company. On January 10, 1902, 4,000 copies were delivered to the advertising department, Bridgeport, for general use. January 24-25, 1902, 5,000 copies



129  
were sent to the Philadelphia office, and on February 10, 1902, 500 copies to the Boston office.

Complainant's counsel offers in evidence copy of the circular No. 478, to be marked "Defendant's Exhibit Circular of Jan., 1902."

CROSS-EXAMINATION :

4 x-Q. Who printed circular Form 478 ?

A. Presumably our own printing office.

5 x-Q. Who prepared it ?

A. I think Mr. Easton.

6 x-Q. Where is your own printing office ?

A. In the east building of our factory, next to Railroad Avenue.

7 x-Q. A part of the Bridgeport factory ?

A. Yes, sir.

8 x-Q. Was Circular Form 484 printed at the same place ?

A. It probably was.

9 x-Q. Are copies of these circulars printed here in the Bridgeport factory furnished to the offices of the American Graphophone Co. here in Bridgeport ?

A. The American Graphophone Co. at Bridgeport has but one office, of which the printing department is a section or department. The advertising department was furnished this circular.

10 x-Q. And what is Mr. Macdonald's position in the factory of which the printing office is a department ?

A. The printing office at this time is not a department of the factory. It is under the immediate supervision of the executive office. Mr. Macdonald is the manager of the factory.

11 x-Q. Was the printing office a part of the factory early in 1902 ?

A. My recollection is that it was not, although I could not say definitely until after consulting our records.



133

12 x-Q. Did you find any record of any printed matter relating to molded records earlier than February 15, 1902, other than Circular Form 478?

A. I have not looked for any.

13 x-Q. You do not know of any, however?

A. I do not recollect any particular circulars.

1332  
134 x-Q. How is that your letter to the legal department of January 14, 1904, does not refer to this circular of February 15, 1902, but does refer to one bearing an earlier number and two bearing a later number.

A. I do not recollect upon just what request my letter of January 14 was based. It was upon a certain conversation that I had with Mr. Easton.

15 x-Q. You were asked then only to look up the facts as to the issue of Form 478, and also to send to the legal department copies of Forms 478, 486 and 488, this appearing to be the entire matter covered by your letter of January 14, 1904; is not that so?

1333  
135 A. I do not recollect precisely what I was asked to do. Mr. Easton requested me to look up certain circulars and to send copies of them and the facts as to distribution of form 478 to the legal department. The conversation was rather indefinite. I did what I thought was wanted and I asked the following day whether the information was as desired. I was informed that if anything more was wanted I would be notified later. I received no further notification.

1334  
136 16 x-Q. Did he not ask you to look up all the circulars relating to molded records issued in the early part of 1902?

A. I think he did not.

17 x-Q. Can you produce copies of circulars 486 and 488 referred to in your letter to the legal department?

A. I think so.

18 x-Q. In your answer to Q. 2, you appear to seek to give the impression that there was some circular issued prior to February 15, 1902, referring to a different kind of molded record. What is the basis for that statement?



A. That portion of my answer to Q. 2, which says, "and, second, to the 'extra loud high speed' molded record as distinguished from the ordinary molded record," was intended to call attention to the difference between the previous kind of molded record and the so-called extra loud high speed molded record.

19 x-Q. Was there any circular issued prior to February 15, 1902, referring to what you call in answer to Q. 2, "the ordinary molded record"?

A. Yes, sir.

20 x-Q. Please produce it and read that portion which refers to the "ordinary molded record"?

A. I produce Form 478 in its entirety.

21 x-Q. That being the circular already introduced in evidence by the defendant, please state where that circular refers to the "ordinary molded record"?

A. I did not mean to say that Form 478 contains the words "the ordinary molded record."

22 x-Q. Does it describe any record as "molded"?

A. It does not use the word "molded" but refers to the molded record.

23 x-Q. In what way does it refer to the molded record?

A. It specifies various advantages of such a record.

24 x-Q. Is it not a fact that that circular advertises for sale cut duplicates made from what the circular calls a "permanent" master record?

A. To the best of my knowledge and belief this circular refers especially to actual molded records and not to cut duplicates.

25 x-Q. How long have you been employed by the American Graphophone Co. or the Columbia Phonograph Co.?

A. With a very slight intermission about 14 years.

26 x-Q. What were your duties in January and February, 1902?

A. Same as at present.

27 x-Q. Were the molded records which were brought out in March, 1902 (and advertised as such), different



141

from the molded records which had been made by the defendant before that time ; if so, in what respect ?

A. I do not say upon what date the so-called " high speed extra loud " records were brought out. Such records differed from previous molded records in being made at higher surface speed, and louder.

28 x-Q. What were the reasons that led to th changing of the defendant's molded records in these respects ?

142

Objected to as immaterial.

A. Improvement.

29 x-Q. I suppose that you would not endorse the statement that these changes were made to make the defendant's molded records like the Edison molded records which had been brought out and whose characteristics of high speed had been widely exploited with the trade.

143

Same objection.

A. The changes were for the purpose of improving the product. Loudness has been desirable always and the high surface speed was a feature of the Graphophone-Graud which was invented by Mr. Macdonald.

144

Defendant's counsel interrupts to say that in view of the insinuation sought to be conveyed by the last cross-question, which is somewhat in the line of previous cross-questions, he will ask the Court for leave to show that in this particular, as in all others in this art, the American Graphophone Co. is the pioneer and the Edison Company the imitator. Specifically he will ask leave to show that after attempting for many years to prevent the issue of Macdonald's high speed patent, the Edison Co. when sued thereunder procured a license to use it.



145

Complainant's counsel ventures to anticipate the action of the Court on any such motion by stating that such a large commission to delay the hearing and encumber the record, will probably not be granted. If the issues of this case made the matter material, complainant's counsel will welcome the motion, with confidence that the result will be entirely favorable to the complainant.

146

Signatures and certificates waived by consent and the further taking of testimony adjourned subject to notice.

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148



189

## UNITED STATES CIRCUIT COURT.

THE NATIONAL PHONOGRAPH CO.,  
Complainant,

vs.

190 THE AMERICAN GRAPHOPHONE CO.

In Equity  
No. 1076.

BRIDGEPORT, CONN., Jan. 13, 1903.

Testimony taken for final hearing on behalf of the defendant before E. E. MARVIN, a Standing Examiner of the Court, at the office of the American Graphophone Co., on the 13th day of January, 1903, and put in typewriting by John R. Petrie, as specially agreed to by the parties and appointed by the Examiner.

Present—MR. PHILIP MAURO, for the defendant, and MR. FRANK L. DYER, for the complainant.

Thereupon EUGENE E. NORTON, being duly sworn as a witness on behalf of the defendant, deposes and says as follows :

DIRECT EXAMINATION BY MR. MAURO :

192 1 Q. State your name, age, residence and occupation?

A. Eugene E. Norton, 47 years of age, Nichols, Conn.; mechanical engineer.

2 Q. Where are you now employed?

A. American Graphophone Co.

3 Q. For how long have you been in the employ of the American Graphophone Co.?

A. Eight years last September.

4 Q. Your work during that time has been at the



factory of the American Graphophone Co. in Bridgeport, where this testimony is being taken, has it?

A. Yes, sir.

5 Q. I show you a piece of apparatus. Please state if you have ever seen it before and if you know what it is?

A. I have. It was designed and made for a steam mold for making blank cylinders.

6 Q. By whom was it designed?

A. By Mr. Macdonald.

7 Q. Give his full name, please.

A. Thomas H. Macdonald.

8 Q. Do you know where that apparatus was made?

A. I am positive it was made at the Pacific Iron Works, in the City of Bridgeport.

9 Q. When was it made?

A. About 1895, some time in 1895; I couldn't state positively; that is as near as I can remember.

10 Q. Do you know what use was made of that apparatus after it was completed?

A. It was set up, as I remember, and tried and the surface found to be too hard, as near as I can remember.

11 Q. What was made in that apparatus?

A. Blank cylinders.

12 Q. Please describe just how they were made.

A. They were made by setting a core inside the brass shell, wax poured around them, steam applied, steam was closed off and water turned on to chill them.

13 Q. How was the cylinder removed from the mold?

A. The water was turned on and the cylinder was allowed to contract, and the core and cylinder were drawn out together.

14 Q. What was the material that was used to make these blank cylinders?

A. The material was the same as now in use; the formula I don't know.



197

15 Q. Is it the same material as is now used for making record cylinders?

A. As far as I know.

16 Q. Do I understand your testimony that the surface of these cylinders was too hard for cutting a record?

A. That's the way I remember it.

1350  
198 17 Q. You have spoken of steam and cold water being applied. In what part of the apparatus were the steam and water admitted?

A. It was admitted in the same compartment.

18 Q. Can you indicate the pipes to which the steam was admitted?

A. It is immaterial which pipe, either this (indicating) or that (indicating). (The witness indicates the two branch pipes which unite and communicate by common pipe with the space surrounding the several cavities of the apparatus).

1351  
199 19 Q. As I understand you, after the melted material was poured into the molds, steam was admitted to one of these pipes, then the steam shut off, and cold water turned in to chill the melted material? Is that correct?

A. That is correct.

20 Q. Can you give any idea of the number of cylinders that were molded in that apparatus?

A. No, sir; I couldn't give any idea; I don't remember.

1352  
200 21 Q. In what year was that apparatus first used to your knowledge?

A. I think it was in 1895.

22 Q. Did you examine any of the cylinders that were molded in it?

A. Not particularly; no, sir.

23 Q. Did you do anything yourself to determine the hardness of the surface?

A. No, sir.

24 Q. How did you learn of the hardness?

A. I merely heard so.



25 Q. Merely told so?

A. Merely told so.

No cross-examination.

Certificate and signature waived.

Defendant's counsel offers in evidence the apparatus referred to by the witness, to be marked "Defendant's Exhibit Macdonald's 1895 Mold." 202

THOMAS H. MACDONALD, being duly sworn as a witness on behalf of the defendant, deposes and says as follows:

DIRECT EXAMINATION BY MR. MAURO:

1 Q. Please state your name, age, residence and occupation? 203

A. Thomas H. Macdonald; age, 43; residence, Bridgeport, Conn.; manager factory American Graphophone Co.

2 Q. Are you the inventor of the process and the molded sound record described respectively in Patent No. 682,991 and No. 682,992, dated September 17, 1901?

A. I am.

3 Q. How long have you been connected with the art of recording and reproducing sounds? 204

A. Since April, 1889; nearly 14 years.

4 Q. How long have you been manager of the factory of the American Graphophone Co.?

A. Since May, 1891; nearly 12 years.

5 Q. Are you familiar with the compositions commonly used for making sound record blanks or tablets?

A. I am.

6 Q. From what date does your familiarity with those compositions extend?



205

1256  
A. My first attempt at molding blanks was in July or August, 1889, while in the Philadelphia office of the North American Phonograph Co.

7 Q. Is your familiarity with those materials of a practical sort, such as to make you acquainted with their properties?

A. It is.

8 Q. Please describe how the blanks were made in 1889, as referred to in your previous answer?

206

7  
A. The experiments that I made at that time were merely remolding of broken Edison blanks. The experiments were for the purpose of ascertaining if it were possible to place this mixture on a solid base, such as wood or fibre or other substance that would make a stronger blank than that then in use for the phonograph. The mold consisted of a piece of brass tubing, about two and one-half inches in diameter, inside, and about six inches long. Inside of this was placed the core that I was experimenting with and the wax was melted and poured around it. After it was cooled I removed the blank so made and turned it down for use upon the phonograph.

207

9 Q. How was the article removed from the mold?

A. When it became cool it dropped out of the tube and drew it out; it came out quite easily.

10 Q. Does this particular material have a high coefficient of expansion?

A. It has.

208

11 Q. Did you in 1889 experience any difficulty in withdrawing the molded article from the mold?

1318  
A. Not if we allowed it to become sufficiently cool, as soon as the wax cooled it would come out easily; we found that it shrank very much, so much so that it spoiled all of my experiments, as it would contract down on my core and usually split before I could do much with it.

12 Q. In the ordinary commercial manufacture of wax cylinders for sound records is the operation of molding or casting employed?

A. It is.



209

13 Q. How long has it been employed under your direction in this factory?

A. Almost continuously since 1891, and continuously so since 1894. I was doing experimental work in 1891 to 1894 in this line most of the time.

14 Q. Are the molds that have been used for this purpose almost continuously since 1891 continuous cylindrical molds or are they split?

A. They are continuous cylindrical molds.

15 Q. How are the molded articles removed from the molds?

A. After they have cooled sufficiently they are withdrawn longitudinally, by direct longitudinal movements.

16 Q. And this has been the practice since that manufacture was begun in the factory and continued down to the present time?

A. It has.

17 Q. What is approximately the amount of shrinkage of an ordinary sound record cylinder?

A. The longitudinal shrinkage is about two one-hundredths of an inch; its circumference will shrink a little more than that, I think, possibly, between two and three one-hundredths.

18 Q. That is the ordinary small blank?

A. Yes, that is the ordinary two and three-sixteenths blank.

19 Q. Is the shrinkage of this material a matter of common knowledge among those who work in it?

A. It is.

20 Q. How much diametrical shrinkage is necessary in order to clear a molded sound record from the mold?

A. About one-thousandth of an inch.

21 Q. Taking the ordinary small blank, the shrinkage is about how many times greater than is necessary to effect this clearance?

A. Certainly six or seven times, I should say.

22 Q. Please look at the apparatus I now show you and state if you know what it is?

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A. I do. I recognize this apparatus as something which I designed and had built.

23 Q. When did you design it?

A. In 1895, I think.

24 Q. Can you produce a photograph of that apparatus?

A. I can.

25 Q. Please mark the different parts of that apparatus with letters of reference and describe them?

214

A. The apparatus I have designated as a steam jacketed mold; that is the heavy casting "h" is made hollow. Connected to the hollow casting is the steam pipe "c." This pipe has two connections "d" and "e"; one of these to be used for a live steam connection and the other for cold water. Both of these connections to be controlled through ordinary valves. The pipe marked "f" was the outlet, or drip pipe, for both steam and water. The pipe marked "g" was

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merely what is known as a pet cock, or was placed there for the purpose of giving vent to the jacket when needed. The holes marked "a"—seven of them—are bored in the casting. Into these holes it was intended to be placed a brass shell, shown in the centre at "b." In this brass shell was placed the core of an ordinary blank mold. Wax was then poured in to fill the molds around the core. Steam was then turned on from the steam connection and the entire mold raised to the temperature of the live steam. Steam was then turned off and from the cold water connection the mold was filled; that is, the jacket was filled with cold water. This of course had the effect of quickly chilling the wax. The molds were then withdrawn from the apparatus, and the resulting cylinder had a perfectly smooth surface, and the intention was to make the record directly upon this surface without the necessity of shaving or turning the blank.

216

26 Q. What was the character of the surface obtained in that way?

A. The surface was very smooth and a perfect reproduction of the interior surface of the brass mold.



We found, however, upon experiment, that it was very much harder than the ordinary shaved blank, so much so that it was not practical for use in record making.

27 Q. In using that apparatus how was the molded article removed from the mold?

A. It was drawn directly out of the mold by a straight longitudinal movement.

28 Q. Was the core removed first or the article and core together?

A. The core and blank were removed together.

In some of the experiments we removed the core first; in fact, we experimented with it both ways.

29 Q. In the practical manufacture of molded sound records what do you do?

A. We remove the core first, before removing the molded record from the mold.

30 Q. Where was that apparatus made?

A. At the Pacific Iron Works, in Bridgeport.

It is noted that the apparatus regarding which the witness has been testifying is that marked "Defendant's Exhibit Macdonald 1895 Mold."

Defendant's counsel now offers in evidence the photograph which has been described by the witness, to be marked "Defendant's Exhibit Photograph 1895 Mold."

31 Q. In the use of this apparatus did you ever do anything to determine whether the wax would take perfectly the impression of the interior surface of the mold?

A. I did. The mold was used quite extensively for this purpose. I marked the polished surface of the brass mold and found that such marking was accurately reproduced on the face of the molded blank. We found that even small stratas, which came from buffing the surface of the mold, were accurately reproduced in the molded blank.



221

32 Q. When was this apparatus first used by you for molding wax cylinders?

A. I think it was in the latter part of 1895, though it might have been in the early part of 1896.

33 Q. How far back are you able to say with certainty that this apparatus was used by you in the way you have described?

A. I should say with certainty it was used prior to the first of June, 1896.

222

34 Q. How does the process employed with that apparatus resemble, and how, if at all, does it differ from the process described in your Patent No. 682,991?

A. It differs in no essential whatever. In both cases the wax is heated after being introduced into the mold for two purposes to eliminate all possible bubbles either of imprisoned air or gases that form in the wax, and also to render the wax perfectly limpid, so that it will form an intimate union with the surface of the mold and so faithfully reproduce anything that

223

may be found on that surface.

35 Q. After superheating, describe the other steps in both cases?

A. After superheating in the blank mold by the aid of steam at high temperatures, cold water was introduced in the same jacket surrounding the blanks. This was exactly the same thing done in the case of a molded record, as described in the patent mentioned. The blank, shell and core were then removed from the molds and this was done in both cases. The core was removed from the wax and the resulting wax mold or wax molded record removed from the shell.

224

36 Q. There is a difference in the apparatus in the two cases in respect of the markings on the inner surface of the mold, is there not?

A. There was. In the case of the molded blank, the markings were such irregular markings as would be found upon the surface of polished metal, or such as had been placed there by design. In the case of the molded record, the markings would be the electrotyped



225  
sound waves, which had been previously prepared and placed inside the brass shell.

37. Q. Was the method of removing the article the same in both cases?

A. It was.

38 Q. So that whatever difference there is lies in the apparatus and not in the process; is that correct?

A. That is correct.

39 Q. When did you first employ your process with a mold that had a sound record in negative on the interior? 226

A. In the month of February or March, 1899.

40 Q. Did you employ the same apparatus for that purpose, or another one?

A. I employed another apparatus.

41 Q. Can you produce it? Do you know where it is?

A. I do not know where that apparatus is at the present time, though I have a photograph made of it.

42 Q. What is the last knowledge you have of it? 227

A. I had it in the laboratory and in my private office of that laboratory two or three months ago. Since that time it has disappeared.

43 Q. Have you made or caused to have been made a search for it?

A. I have.

44 Q. Please produce the photographs you spoke of and describe them?

A. I here produce the photographs. These photographs show the apparatus very clearly; "a" is a base of brass; "b" represents a brass shell, in the inside of which, shown at "d," is a copper electrotpe of a record; "c" is a core which is made of aluminum and was placed inside the matrix shell "b," and when the apparatus was ready for use it was assembled, as shown in photograph No. 2. There is one part of this apparatus missing. Around the base of the brass block "a" is shown a groove "e." In this groove was to be placed a second brass shell considerably larger than the matrix shell "b," and also a little longer. 228



229

45 Q. You say that in that groove was to be placed another shell; was that other shell ever actually a part of the apparatus?

A. It was and always used with it.

46 Q. Now, please describe how you used that apparatus?

1374  
230 A. The apparatus was assembled as shown in Figure 2. The larger brass shell mentioned was then placed in the groove "e," wax was then poured into the mold between the matrix shell "d" and the core "c;" then in the space around the matrix shell and inside the larger shell mentioned wax heated to a much higher temperature than the wax from which the mold was to be made was poured. The object of this was to duplicate quickly the action of the steam mold. That is, to heat up the wax from which the molded record was to be made to a higher temperature while in the mold itself. After this had been done the outer shell was lifted and  
231 the heating wax allowed to run away. I then placed the entire mold in cold water so that the water reached nearly to the top of the matrix mold; thus quickly chilling the molded record inside. After this the core and the resultant molded record were removed in the same manner that I have described in the case of the molded blank.

47 Q. Where did you procure the matrix that was first used with that apparatus?

1375  
1376  
232 A. When the subject was first talked of, one of the workmen in the laboratory stated that he had a friend who was an electrotyper, and that he thought he could electrotype one of these cylinders, and that if I had no objection he would be glad to have him do it. I instructed him to have that done. When the matrix first came to me, however, it appeared to be so poor from a mechanical standpoint that I did not at once use it; in fact, had thrown it aside in the laboratory as not good enough to waste time in experimenting upon, and had made preparations to, if possible, get a better piece of plating done in the factory. But finally



decided to try out the experiment with the matrix as it was. The results were such as to cause me to press the experiments then in that line as rapidly as possible.

48 Q. Did the records made by your process in that apparatus copy faithfully all the imperfections of the matrix?

A. It did; it copied them most faithfully.

49 Q. How long before the mold itself was set up, did you take steps for getting this matrix or electrotype?

A. Well, I should say several months; I can't recall the exact time; but should say it was about six months; possibly not quite so long.

50 Q. Who did the work of putting the parts of the mold together?

A. Frank Osborne, one of the workmen in the laboratory.

51 Q. Complainant's witness Pierman testifies to having had knowledge of your molded record work in in the latter part of 1899. What apparatus were you then using?

A. I was experimenting with this mold, which I have just described. I was also doing some experimenting with the cast iron steam jacketed mold, which I have previously described, and also with a steam jacketed mold which was afterwards actually used for commercial product.

52 Q. When you procured the electrotype, which was first used with the 1899 mold, did you have facilities at the factory or laboratory for electrotyping sound records?

A. We had not.

53 Q. Did you subsequently equip for that work?

A. We did.

54 Q. In the commercial manufacture of molded sound records by the defendants are electrotypes used as the matrices?

A. They are.

55 Q. Have you, or has the defendant, ever made



287 sound record matrices by the process of vacuous deposit?

A. I never have; no such records have ever been made to my knowledge in the factory.

56 Q. When was the making of molded sound records put on a commercial basis at the factory of the American Graphophone Co? I mean when were the first molded sound records made for commercial product?

1380  
288 A. The latter part of 1899 we obtained some records which were used as masters on our duplicating machine. This would probably be the first time which we used a molded record in a commercial sense. I don't remember positively when the first ones were made for sale; but I think it was early in the year 1900.

1381  
57 Q. Has the defendant, to your knowledge, ever made a molded record by introducing melted wax into a mold, relatively cold or of a materially lower temperature, so as to produce an almost instantaneous chilling of the surface of the molten material?

A. To my knowledge defendant has never made records in that manner.

58 Q. Is it your experience that a satisfactory sound record can be made in that manner?

A. My experience has been that I have never gotten satisfactory results from that method of molding.

59 Q. What are the defects of that method, when employed with the ordinary wax compositions?

1382  
290 A. The wax I have found chills so quickly that it does not give a perfect reproduction of the surface of the mold. There are what we call "rundowns," that is, the wax appears to have streaked the surface of the blank; I also found that air would frequently be imprisoned in minute bubbles on the surface.

60 Q. How does melted wax when poured upon a cold metallic surface act in comparison with its action when poured upon a hot metallic surface?

A. When poured upon a cold surface it is chilled so quickly that you do not get a faithful negative of the



surface. When the surface is heated to the same temperature as the wax or a degree materially above it, the wax will run into and intimately reproduce all the depressions, elements, etc., of the surface.

61 Q. In the making of molded records, does the defendant ever remove the molded article and core together from the mold, and then separate the core from the molded article?

A. We do not.

62 Q. What has been the manufacturing practice in this regard in molding blank cylinders?

A. We have made blank cylinders in both ways; but our practice is now to first remove the shell and then remove the core.

63 Q. What was the practice in the early days, say as far back as 1894?

A. The practice then was to remove the core first from the cylinder and then after a cylinder had cooled down it would drop out of the shell itself, and the shell would be lifted out of the core out on to the table.

Adjourned until to-morrow, Tuesday, January 14, at 10 o'clock.

BRIDGEPORT, CONN., January 14, 1903.

Met pursuant to adjournment.

Present—Same parties.

Defendant's counsel offers in evidence two photographs described by the witness, and the same are marked "Defendant's Exhibit Photo. 1899 Mold No. 1" and Defendant's Exhibit Photo. 1899 Mold No. 2."

64 Q. How many threads to the inch are there in molds ordinarily used by the defendant in making molded records?



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A. Ninety-eight and one-third.

65 Q. In consequence of the shrinkage do the threads draw together?

A. They do.

66 Q. Do they draw together just the same if they have a hundred threads to an inch, or any other number?

A. They do.

248 67 Q. Is the process of using a mold which has a hundred threads to an inch the same as the process of using a mold which has 98 threads to the inch, or is it a different process?

A. The process is the same in both cases.

68 Q. Are you able to-day to fix with greater certainty the time of construction of the Exhibit 1895 mold?

947 A. I am. The mold in question was made under the immediate direction of Mr. Geo. L. Hubbell, who was then the draughtsman in our employ. He made the sketch for it and superintended its construction. The pay-roll books of the company show that Mr. Hubbell left our service on August 23, 1896. I have positive recollection that the mold was finished and tried a considerable time before Mr. Hubbell left. I should place that time at certainly six months.

69 Q. After your work with that iron mold in 1896 was there anything required for making good sound records except a good mold?

A. There was nothing else lacking.

948 70 Q. Was there in 1896 anything lacking in the process as you now carry it on?

A. There was nothing lacking in the process.

71 Q. Can you produce an ordinary blank mold and core such as you have used commercially for the past ten years or so?

A. Yes.

72 Q. Please describe how blanks have been made by means of these devices during the past ten years?

A. The mold is set up on a table, the molten wax is poured in between the core and the outer shell. It is



then allowed to cool. When the wax has congealed sufficiently the overflow around the top is removed. The entire mold is then picked up containing the core, the wax blank and the shell. The protecting rod in the bottom of the core is slipped in an arbor and the shell is slipped over and off the blank. The blank is then unscrewed from the core, when the operation is finished.

73 Q. By what sort of a movement is the molded article withdrawn from the mold?

A. By direct longitudinal movement.

Defendant's counsel offers in evidence the blank mold and core produced by the witness to be marked "Defendant's Exhibit Blank Mold."

CROSS-EXAMINATION BY MR. DYER:

1 x-Q. You do not claim to have made a molded duplicate record before 1899, as I understand it?

A. I do not.

2 x-Q. So that all of your work with the 1895 mold, which has been introduced here, related to the manufacture of blanks?

A. The experiments I carried on at the time the mold was made in 1895 were only with a view to making blanks, but the mold was used in 1898 and 1899 with the view then of making molded records.

3 x-Q. Did you use it in 1898 for this purpose?

A. Possibly not, in 1898; certainly 1899 I used it for a considerable time to ascertain how accurately a molded record or an article molded in cylinder wax could be made; all with a view to making the molded record when a suitable mold could be gotten.

4 x-Q. When did you obtain what you would call a suitable mold?

A. In February of 1899; the mold with which I made the two cylinders I have offered in evidence gave sufficient results to convince me it was merely a matter of mechanical detail to obtain a commercial product.



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5 x-Q. Was the mold which you had in February, 1899, good enough to enable you to make commercially salable records?

A. From that mold—no.

6 x-Q. Did you use the 1895 mold for making duplicate records before or after the 1899 mold?

A. After the 1899 mold.

7 x-Q. In answer to question 17 you state that the longitudinal shrinkage of your records is about two one-hundredths of an inch. Did you mean by this that the record throughout its length shrunk only two one-hundredths of an inch?

A. Two one-hundredths to the inch.

8 x-Q. How long are these records?

A. A finished record is four inches.

9 x-Q. So that the longitudinal shrinkage amounts to about eight complete record grooves?

A. Very nearly that.

10 x-Q. In the same answer you state that the radial shrinkage is between two and three one-hundredths of an inch. Does this mean the entire radial shrinkage?

A. I meant by that the reduction in the diameter of the blank. The circumference of the cylinder is perhaps a little more than its length. The circumferential shrinkage is theoretically the same as the longitudinal, but the direct diametrical shrinkage would of course be a little less than one-third of this. It is possible that the core has something to do with the amount of shrinkage of the diameter. If the core is removed when the cylinder is comparatively soft the shrinkage is more than if it is left in a longer period.

11 x-Q. After you made your experiments with the 1895 mold and found that you obtained a blank having such a hard surface "that it was not practical for use in record making," as stated by you in answer to question 26, what did you do with this mold?

A. It was laid aside in the laboratory.

12 x-Q. In your Patent No. 682,991, you state that the mold and its contents are heated to a temperature



of about 350 degrees centigrade. Is not your patent misleading in this statement?

A. I am afraid it is. Centigrade there should be Fahrenheit.

13 x-Q. In answer to question 31, referring to the experiments made by you with your 1895 mold, you stated that you "marked the polished surface of the brass mold." Were these markings applied for any useful purpose?

A. They were. It was for the purpose of ascertaining how accurate such an apparatus would reproduce in wax the surface of the mold used.

14 x-Q. Did you contemplate making anything in 1895 other than blanks?

A. I did not.

15 x-Q. As I understand it, with your 1895 mold you used a perfectly smooth blank mold, while with the process described in your Patent No. 682,991 you used a mold having the negative representation of a sound record on its core. Is this correct?

A. That is correct.

16 x-Q. And with your 1895 mold you sought only to make a plain blank while with your patent you make a duplicate sound record; is this correct?

A. That is correct.

17 x-Q. Have all your experiments in the making of duplicate sound records from molds or matrices been carried out in connection with the wax like material?

Objected to as immaterial.

A. No.

18 x-Q. Did you ever attempt to make duplicate records by a gelatine process?

The objection is repeated, and the witness is instructed that he is not obliged to disclose any information with reference to experiments or inventions not related to the issues in this case, charge of infringement being based upon the process described in the witness' Patent 682,991.



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A. I have.

19 x-Q. Are you familiar with the patent granted to Capps, No. 666,493, dated January 22, 1901, for duplicate sound record and process of forming same, application filed March 8, 1899, and assigned to the American Graphophone Co., defendant herein?

Objected to as immaterial and not germane to the direct examination.

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A. I have never seen this patent before, although I am familiar with the process used by Mr. Capps.

20 x-Q. Was the gelatine process that you experimented with like that suggested by Mr. Capps or something else?

Same objection as to x-Q. 18.

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A. I presume it was in the same line. Mr. Capps brought his work to the factory and I assisted him as far as I could in any suggestions in his experiments that occurred to me. I never did any work in this line prior to Mr. Capps' coming to the factory.

21 x-Q. Do you recall when Mr. Capps made these experiments under your supervision?

Objected to as immaterial and for the further reason that the witness has not testified that Mr. Capps made any experiments under the supervision of the witness.

264

This inquiry into the history of another patented invention not involved in this case is so plainly improper that defendant's counsel instructs the witness not to answer the question.

A. I decline to answer.

22 x-Q. Can you state whether the experiments with the gelatine process were made before or after the experiments with the molding process?

The same objection and same instruction.



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A. I decline to answer.

23 x-Q. Can you state whether the gelatine process was a success or not?

Same objection, and defendant's counsel submits that he is not called upon to try nor the Court to decide any questions of date or patentability with respect to the Capps' Patent 666,493."

The question is further objected to as incompetent as calling merely for the opinion of the witness.

A. I decline to answer.

24 x-Q. Is it not a fact that you did conduct experiments with the gelatine process, that those experiments were not successful, and that only after such experiments had failed you turned to the molding process?

Same objection, and complainant's counsel is requested to put his questions one at a time in order that such as may be proper may be answered. In the form stated the witness is instructed not to answer the question.

A. I decline to answer.

25 x-Q. Is it not a fact that the experiments with the gelatine process were not successful?

Same objection and instruction. Defendant's counsel has no objection to having it appear that the gelatine process has not been put into commercial use by the defendant, but the question whether or not it is a success is one that cannot properly or conveniently be tried in this case and one as to which the witness is not called upon to express an opinion.

A. I decline to answer.

26 x-Q. Defendant's counsel has, I think, misinter-



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1404  
 preted the question. I do not want to know whether the process as patented by Capps was a success or not. What I want to know is whether your gelatine experiments were successful, in a sense, that you were able to make a commercially satisfactory record?

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Defendant's counsel declines to permit any questions regarding the results of the witness' experiments with the gelatine process; but he has no objection to having the witness testify as to any relation in time between his work on the gelatine process and his work on the molding process, if that be what complainant's counsel desires. If complainant's counsel will ask the witness whether his work on the molding process was after the gelatine experiments were discontinued the question can be answered.

271

A. I decline to answer.

1405  
 27 x-Q. I shall be very glad to ask the question suggested by defendant's counsel, but before doing so I should like to know if it is not a fact that the experiments with the molding process were not made after the gelatine experiments had failed.

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1406  
 Defendant's counsel requests complainant's counsel, if he thinks he is entitled to inquire into the results of experiments in other processes than those at issue, to submit the matter to the Court for a ruling.

Counsel for complainant gives notice that he will instruct the Examiner to certify the papers to the Court in order that the question of the propriety of cross-questions 21 to 27, inclusive, may be determined. Without prejudice the cross-examination is resumed.

28 x-Q. Please state whether your experiments with the molding process were commenced and carried



out before or after your experiments with the gelatine process were discontinued?

A. My experiments in the molding process were begun before I had any knowledge whatever of the so-called gelatine process, and the work which was done upon that process by Mr. Capps did not interrupt or interfere with my experiments in making molded records.

29 x-Q. Did you succeed in making a commercially satisfactory duplicate by the molding process before the experiments with the gelatine process were taken up?

A. I do not know when the experiments with the gelatine process were begun. The process when I first knew it was a finished process.

30 x-Q. Did you ever succeed in making a commercially satisfactory duplicate by the molding process before Mr. Capps, with your assistance, began his work with the gelatine process at this factory?

A. I can't recall just when that process was sent here. Mr. Capps did not come here at the time the process was brought to the factory. I am certain that I did make successful molded records before Mr. Capps first came here; but whether it was before the workmen who were carrying out his process came or not, I could not say.

31 x-Q. Having reference to the 1899 mold, can you say why the outer shell was not included in the photograph?

A. The outer shell was merely a piece of our Grand mold tubing, and when the photograph was made this piece was not found. It had probably been used in the laboratory for some other purpose. I did not care to substitute another piece, so had the photograph made of what was actually used, leaving out the missing portion.

32 x-Q. In view of the fact that your 1895 mold shows a steam jacket for heating the mold, why did you adopt the clumsy expedient in the 1899 mold of heating the mold by superheated wax?



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A. Merely to obtain the effect of a higher temperature than could be obtained from steam, and also to obtain varying temperatures; and I do not regard the method as clumsy.

33 x-Q. This, then, was a pure experiment?

A. It was one of a series of experiments, all with the same object in view to obtaining of exact data from which to formulate a commercial process.

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34 x-Q. You have not stated anywhere when it was that you succeeded in making a commercially successful duplicate record. Please do so, if possible?

A. I think I have stated it was early in 1900. It is pretty difficult to fix the exact date, as on the start the opinions of our commercial people in that line differed quite radically, as they do frequently.

35 x-Q. Can you give the month in 1900?

A. I cannot now recall it.

36 x-Q. Can you state whether you were working on the gelatine process in the latter part of 1899?

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A. My work on the gelatine process was of very little consequence. The process as far as I knew was entirely Mr. Capps', and such assistance as I gave him was merely suggestions as to small mechanical details, and I think none of them in any way affected the process. These suggestions were made from time to time, as the process was used; they were using large quantities of the gelatine cylinders, and in their commercial use certain difficulties would arise, and I made such suggestions as would seem to me might assist in getting rid of small troubles. I could not recall the date.

280

37 x-Q. What is the purpose of the vacuous deposit referred to in the patent in suit?

Objected to on the ground that the witness has not been qualified as a patent expert or called upon to interpret the patent in suit.

A. I presume the object is to obtain a coating over the surface of the blank so that an electrotpe may be made of it.



38 x-Q. In order to electotype a record it is necessary then to first apply a conducting coating?

A. It is.

39 x-Q. Having reference to the 1899 mold, I understand that the molten wax was poured into the mold around the core, and was then superheated by means of superheated wax introduced between the mold and the outer jacket. Is this correct?

A. This method was employed. It would work equally well if we first poured in the superheated wax and afterwards poured the wax into the centre mold to make the record. The only object of superheating is to render the wax from which the record is made perfectly limpid in the mold, prevent chilling on the sides, and to give all air and gas bubbles a chance to rise.

40 x-Q. When superheating is used then it is immaterial whether the mold is heated before or after the wax is introduced therein?

A. It is immaterial whether the superheating is done before or after the wax is poured into the record mold, but I think the heating must be continued and maintained for a period after the wax is poured.

41 x-Q. With your process, after the mold has been chilled with cold water is it heated again before the wax is introduced, or is it heated after the wax is introduced?

A. As I have stated, it is not material, and we have operated with success both ways. But we have found it necessary to maintain the heat after the wax is poured into the centre mold for a space of time to obtain the best results. This is also necessary in carrying out what I believe to be one of the principal features of the patent; that is, to have the mold and wax in it at a high temperature when it is plunged in the cold water, to obtain the chilling or hardening of the surface, which we have found valuable in the molded record.

42 x-Q. When you said in answer to question 57, the defendant has not, to your knowledge, ever made a molded record by introducing molten wax into a mold,

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relatively cold, or of materially lower temperature, so as to produce an almost instantaneous chilling of the surface of the molten material, you meant then that defendant never stopped the process at that point, and removed the records obtained after the wax had become cold, but it always superheated it?

A. That's my meaning.

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43 x-Q. Did you ever attempt to make records without superheating after the wax had been poured into the mold?

A. I have.

44 x-Q. And you found them imperfect?

A. Found poor results.

45 x-Q. Please explain what you mean by "run-downs" in your answer to question 59?

~~287~~

A. This was an appearance that we frequently found on the surface of our cylinders where we did not apply heat to the outside of the mold sufficient to maintain the wax in the limpid state. They were caused by a portion of the wax which struck the surface of the cold mold when it was poured in, and becoming partly congealed, the remaining wax that was poured in would not entirely melt, and it gave the appearance to the record of a piece of wax running down the side of it, and in nearly every case of these "rundowns," as they were termed, we found slight defects in the shape of minute pin holes.

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46 x-Q. In making blanks in Defendant's Exhibit Blank Mold, is the mold superheated?

A. It is not.

47 x-Q. What is the pitch of the record groove of defendant's molded record at normal temperature?

A. About one hundred grooves to the inch.

#### RE-DIRECT EXAMINATION BY MR. MAURO :

1 Re-d. Q. In the 1899 mold, was the outer shell a loose piece, like that on Defendant's Exhibit Blank Mold?

A. It was.



2 Re-d. Q. When did you first observe the mistake in your Patent 682,991 in giving the temperature in degrees Centigrade, instead of degrees Fahrenheit?

A. My attention was called to it by counsel, Mr. Philip Mauro, I think, yesterday morning.

3. Re-d. Q. In the commercial manufacture of molded records by the defendant, is the mold, at the time the wax is poured into it, ever at so low a temperature that the surface of the wax chills and permanently sets upon contact with the mold?

A. It is not.

RE-CROSS EXAMINATION BY MR. DYER :

1 Re-x-Q. In the commercial manufacture of molded records by the defendant, after the mold has been chilled and the record removed, is the mold heated before the next charge of wax is poured into it?

A. It is.

2 Re-x-Q. Heated independently, or merely allowed to attain the temperature of the atmosphere?

A. It is heated independently to a temperature higher than the melting point of the material.

Certificate and signature waived.

ANSON A. STEVENSON, a witness produced on behalf of the defendant, being first duly sworn, deposes and says as follows :

DIRECT EXAMINATION BY MR. MAURO :

1 Q. Please state your name, age, residence and occupation?

A. My name is Anson A. Stevenson; ago, 41; 91 Lee Avenue; foreman of tool department, American Graphophone Co.

2 Q. How long have you been in charge of the tool room of the American Graphophone Co.?



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A. About seven years.

3 Q. Please look at the apparatus I now show you, which is marked "Defendant's Exhibit 1895 Mold," and state whether you have ever seen it before.

A. As far as I can say, it is the same one that was on the bench in the tool room when I took charge of it.

4 Q. That apparatus, or one like it, was on the bench of the tool room when you took charge, was it?

294 

A. Yes, sir.

5 Q. What was the apparatus called in the tool room?

A. Steam jacketed mold.

6 Q. What was it sent there for?

A. To have some work done it; I couldn't say just what.

7 Q. That was the purpose for which the apparatus was sent to the tool room?

A. Yes, sir.

295 

8 Q. After the work was done, do you know what was done with it?

A. It was taken away to some of the laboratories; to where I don't know.

Cross-examination and signature waived.

296

EUGENE H. BYRNES, a witness called for and on behalf of the defendant, being first duly sworn, deposes and says as follows:

DIRECT EXAMINATION BY MR. MAURO:

1 Q. Please state your name, age, residence and occupation?

A. Eugene H. Byrnes; age, 34; residence, 212 Poplar Street; occupation, tool maker.

2 Q. Where are you now employed?

A. American Graphophone Co.

3 Q. In what department?



A. Laboratory.

4 Q. How long have you been employed in the laboratory of the American Graphophone Co.?

A. Four years and two months.

5 Q. You came there then in December, 1898, is that right?

A. December 15, 1898.

6 Q. Please look at these photographs and state if you have ever seen the apparatus represented by them?

A. I have.

7 Q. When did you first see that apparatus and under what circumstances?

A. I should say it was in February, 1899. It was brought in the laboratory at that time to have some work done on it. Mr. Osborne was to do the work on the mold, I think, and I was working on the machine at the time and they were in a hurry for a piece of work and I did some turning on it.

8 Q. What is Mr. Osborne's full name?

A. F. H. I think; I don't know his first name.

It is noted that the photographs identified by the witness are Defendant's Exhibit Photo. 1899 Mold Nos. 1 and 2.

CROSS-EXAMINATION BY MR. DYER:

1 x-Q. You never saw this apparatus in operation did you?

A. No, I did not.

Certificate and signature waived.

FRANK H. OSBORNE, a witness on behalf of the defendant, being first duly sworn, deposes and says, as follows:

DIRECT EXAMINATION BY MR. MAURO:

1 Q. Please state your name, age, residence and occupation?



301

A. Frank H. Osborne; age, 36; 461 Wood Avenue, Bridgeport, Conn.; tool maker by trade.

2 Q. Where are you employed?

A. American Graphophone Co.

3 Q. Since what date?

A. October, 1897.

4 Q. In what department or departments have you been working since October, 1897?

14 28  
302 A. Tool room, laboratory, now inspector of reproducers and recorders.

5 Q. In what department were you working in the early part of the year 1899?

A. Mechanical laboratory.

6 Q. Please look at the photographs I hand you and state if you have ever seen or had anything to do with the apparatus represented by them?

A. I have.

7 Q. What is that apparatus; and what, if anything, have you had to do with it?

14 29  
303 A. I had the making of everything, except the matrix itself. We call it a mold.

8 Q. A mold for making what?

A. What we call for making master records.

9 Q. You made all the parts of that apparatus except the matrix?

A. Except the matrix itself.

10 Q. Is the matrix shown in any of the photographs?

A. It is. It's marked "d" on the photographs.

14 30  
304 11 Q. When did you put that apparatus together, as nearly as you can locate the time?

A. February or the early part of March, 1899.

12 Q. Was there any other work in the laboratory with which you associate that work on the mold?

A. There was.

13 Q. What was that other work?

A. Duplicator for Grand records.

14 Q. Did this work on the sound-record mold come after or before the work on the Grand duplicator?



305

A. It came about the same time, not to exceed six weeks' difference.

15 Q. Did you have anything to do with the use of the apparatus shown in those photographs?

A. I did.

16 Q. Please state what?

A. The first experiments, as I remember, consisted of heating wax. There is one part which is not shown in this photograph, which consisted of brass tubing, fitting the outside recess on casting marked "e." The first experiments, as I remember, consisted in placing mandrel marked "c" into recess marked "a," with shell not shown on recess "e." Melted wax was poured between "c" and "b" at regular temperature, and all different temperatures of wax being tried between shell not shown and "b." We tried that at every heat we could think of, both on the inside and outside, using the higher heat on the outside. It was also tried on blanks, being put on inside of "d," pouring hot wax on the outside.

306

17 Q. What were the articles that were molded in this apparatus?

A. Molded records.

18 Q. Were there a considerable number of these records made?

A. There were.

19 Q. Roughly speaking how many should you say?

A. Possibly 300; probably more.

20 Q. How were the records removed from the mold?

308

A. By allowing to stand and shrink away. They were taken out with your fingers; just lifted up.

CROSS-EXAMINATION BY MR. DYER:

1 x-Q. Was the matrix "d" heated when the melted wax was poured in?

A. It was tried all ways.

2 x-Q. You tried it hot and cold?

A. All ways.

Certificate and signature waived.



IN THE UNITED STATES CIRCUIT COURT  
FOR THE DISTRICT OF CONNECTICUT

THE NATIONAL PHONOGRAPH CO.,  
Complainant,

vs.

THE AMERICAN GRAPHOPHONE CO.,  
Defendant.

In Equity, No. 1076  
Same title, No. 1103.

150

1434

**Testimony for Final Hearing**

taken on behalf of the defendant before E. K. CAMP, Esq., Notary Public, at the office of the Columbia Phonograph Co., No. 90 West Broadway, New York City, February 17, 1904, under the provisions of the Revised Statutes of the United States.

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MR. RICHARD N. DYER appeared for the complainant,  
MR. PHILIP MAURO appeared for the defendant.

1435

Thereupon, EDWARD D. EASTON being duly sworn,  
deposes and says :—

DIRECT EXAMINATION BY MR. MAURO :

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Question 1 : State your name, residence, and occupation.

Answer : Edward D. Easton ; Arcola, N. J.; president of the American Graphophone Co., the Columbia Phonograph Co., and other companies.

Q. 2. I call your attention to circular, Form No. 478, entitled "A Revolution in Record Making," which has been marked in this case "Defendant's Exhibit Circular January, 1902;" do you know who prepared that circular ?

1436



~~153~~

A. I do. I prepared it.

Q. 3. To what particular kind of record does that circular refer?

A. The moulded record.

Q. 4. How long before that circular was printed had the American Graphophone Co. been making and selling moulded records?

A. More than a year.

~~154~~

Q. 5. By whose directions were moulded records put on the market for sale?

A. By mine.

Q. 6. Is it your practice to see personally that orders of this character are executed?

A. It is.

Q. 7. Do you visit the factory at Bridgeport? If so, how often?

A. Frequently. I endeavor to go once a week.

Q. 8. This circular says: "We have been making these records for over a year." Did you know that statement to be correct at the time it was made?

~~155~~

A. I did.

Q. 9. Now, with reference to the sale of moulded records, can you state whether or not the selling of them began at or about the time the manufacture began?

A. It did.

Q. 10. What other use was made of the moulded records besides putting them out for sale?

A. They were used to some extent to duplicate from.

~~156~~

Cross-examination waived by complainant's counsel.

Signature and certificate waived.

Defendant's counsel offers in evidence in suit No. 1076 deposition of Thomas H. Macdonald, taken at Bridgeport, January 28, 1904, in case No. 1103, it having been stipulated by complainant's counsel that this deposition may be admitted in evidence in this case.

Also the following specified exhibits:—



Copy of agreement dated December 7, 1896, between the American Graphophone Co. and the National Phonograph Co. and Edison Phonograph Works, to be marked "Defendant's Exhibit Graphophone-Phonograph Agreement." And it is stipulated that the copy here introduced is a correct copy of said agreement, the acknowledgments being omitted, and the admission being subject to correction of errors if any appear.

Also copies of the following U. S. patents:—

No. 341,214 to Bell and Tainter.

No. 341,287 to Tainter.

No. 606,725 to Macdonald.

No. 559,806 to Macdonald.

No. 528,273 to Lioret.

No. 303,970 to Appelt.

No. 563,572 to Day.

No. 400,647 to Edison.

Also British patent No. 1478 of 1894 to Young.

Each of said copies of patents to be marked as above with the prefix: "Defendant's Exhibit."

Defendant's counsel desires it to be noted that, in compliance with requests of complainant's counsel, which appear on the record, he has produced Defendant's Catalogue of Moulded Records, of March, 1902, and letter of Mr. Mauro to Mr. Macdonald of December 20, 1900, the only part of said letter of Dec. 20, 1900, which relates to moulded records being the following:—

"P. S. Mr. Easton advises me that you have noted certain additional characteristics in your new record, such as the increased smoothness of the surface, etc. I will trouble you to be so kind as to send a memorandum of these matters to Mr. Massie, of my office."

DEFENDANT RESTS IN No. 1076.



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IN THE  
CIRCUIT COURT OF THE UNITED STATES.  
DISTRICT OF CONNECTICUT.

NATIONAL PHONOGRAPH COMAANY  
Complainant

vs.

AMERICAN GRAPHOPHONE COMPANY,  
Defendant.

162  
In Equity No.  
1103.

BRIDGEPORT, CONN., Jan. 28, 1904.

THOMAS H. MACDONALD, recalled, is examined

BY MR. MAURO.

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1 Q. Have you personal knowledge of the use in the art of casting, of an implement known as the "shrinkage" rule, such as defined in the extracts from publications which I now hand you; if so, how long have you had such knowledge.

Objected to as immaterial and irrelevant.

A. I have. I have known such rule for 20 years.

1445  
164

2 Q. Can you mention any cast articles, to the measurement of the patterns of which it is customary in the art as applied to the shrinkage rule, and which articles have spaced parts, such as teeth or screw threads.

Same objection.

A. I can. The shrink rule is commonly used by pattern makers for making the patterns for casting of gear wheels cast threads, such as those used on large water faucets, used upon large cast screws and other articles of that description. In some cases the article s



were cast in moulds and in this case the shrink rule is used to lay out the mould, and is so made as to provide for the shrinkage in every direction.

No cross-examination.

Defendant's counsel offers to be printed in this record the extracts from the publications referred to in the foregoing questions, to be marked "Defendant's Exhibit Extracts from Publications Defining Shrinkage Rule".

It is stipulated that the extracts on this type-written sheet are correct copies from the publications referred subject to correction by either party if mistakes therein should be discovered.

Complainant's counsel objects to the Exhibit as immaterial and irrelevant.

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